

Flavonoids and phenolic acids from pearl millet (*Pennisetum glaucum*) based foods and their functional implications

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ABSTRACT

Background: Pearl millet (*Pennisetum glaucum*), considered a poor man's cereal, may be a repository of dietary antioxidants, especially flavonoids and phenolic acids, which provide bioactive mechanisms to reduce free radical induced oxidative stress and probably play a role in the prevention of ageing and various diseases associated with oxidative stress, such as cancer, cardiovascular, and neurodegenerative diseases.

Objective: The present study focused on the identification of individual flavonoids and phenolic acids from seven commercial varieties of pearl millet and five samples of pearl millet-based traditional recipes of Banaskantha, Gujarat, India.

Methods: Total phenols were determined by the Folin-Ciocalteu method, and individual polyphenol separation included the isolation and identification of (a) flavonoids, (b) phenolic acids, and (c) glycoflavones involving interaction with diagnostic reagents and paper chromatographic separation of compounds and their UV-visible spectroscopic studies including hypsochromic and bathchromic shifts with reagents such as AlCl₃, AlCl₃/HCl, NaOMe, NaOAc, and NaOAc/H₃PO₃. Five traditional recipes consumed in the pearl millet producing belt of Banaskantha, Gujarat, India, were standardized in the laboratory and analyzed for phenol and individual flavonoids.

Results: Total phenols in raw samples ranged from 268.5 - 420mg/100g of DW and 247.5 -

335mg/100g of DW in cooked recipes. The commonly identified flavonoids were tricetin, acacetin, 3, 4 Di-OMe luteolin, and 4-OMe tricetin. Five phenolic acids were identified: namely vanilic acid, syringic acid, melilotic acid, para-hydroxyl benzoic acid, and salicylic acid.

Conclusion: The presence of flavonoids, such as tricetin, acacetin, 3, 4 Di-OMe luteolin, and 4-OMe tricetin, indicate the chemopreventive efficacy of pearl millet. They may be inversely related to mortality from coronary heart disease and to the incidence of heart attacks in the pearl millet consuming belts of the world.

Keywords: Polyphenols, Antioxidant, Flavonoids, Total Phenols, Pearl Millet (raw and cooked) (*Pennisetum glaucum*), Banaskantha, Gujarat.